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How does a pto dynamometer work

Motor and engine testing dynamometers apply braking or drag resistance to motor rotation, and measure torque at various speeds and power input levels. These devices measure the output torque of motors, engines, gearboxes, transmissions and other rotary machines and they can include features such as fuel and exhaust monitoring for internal combustion engines, input power analysis for electric motors, and temperature and vibration sensing. Air dynamometers use an impeller to assess the power produced by a jet engine or gas turbine. AC dynamometers are essentially AC motors mounted and configured to provide drag against the motor being tested and output the resultant torque and power. DC dynamometers are essentially DC motors mounted and configured to provide drag against the motor being tested and output the resultant torque and power. Eddy current dynamometers use a magnetic field to provide counter restraining torque that increases with shaft speed. Hydraulic or water brake dynamometer, braking drag is applied to the dynamometer rotor vanes via water circulating between the rotor and the stator housing. Hysteresis dynamometers use noncontact magnetic braking to apply resistance to motor rotation. A magnetic powder dynamometer has a friction braking system using a magnetic powder medium between the rotor and the stator. With a prony or friction brake dynamometer the braking mechanism uses friction pads or brake shoes to engage the rotating disk or drum coupled to the motor. A combination of two or more technologies is a tandem or combination dynamometer. Important performance specifications to consider when searching for dynamometers include maximum power absorption, torque capacity, maximum rotary speed, and maximum linear speed or Chassis style. Maximum power absorption is the maximum rotational power the dynamometer can be subjected to and still operate within specifications. This is typically limited by absorption or braking technology and configuration. The torque capacity is the maximum continuous torque transmission for which the shaft is designed. Maximum rotary speed is the maximum rated rotational speed under load. For chassis style dynamometers the maximum linear speed of the vehicle being tested is typically given in vehicular speed units such as miles per hour. Mounting types for dynamometers include chassis, stand or pedestal, adjustable or trunnion mount, flange or shaft mount, and portable. In a chassis type unit, rollers on the dynamometer support the wheels of one or more axles. One of the rollers transmits the power from the vehicle to the dynamometer for measurement of horsepower and speed. Vehicles typically drive onto the rollers and/or the rollers lift up from a pit or recess. Environmental regulations often require a dynamometer during exhaust emission testing. A stand or pedestal mount is a stationary mount or stand for positioning; may be permanent or moveable between tests. With an adjustable or trunnion mount the dynamometer can be adjusted for horizontal, vertical, or intermediate testing. This is typically achieved through trunnion mounting so the dynamometer can pivot to the desired angle. A flange or shaft mount dynamometer has a flange that couples with flange on motor or engine for direct, in-line mounting. Portable dynamometer units can be relocated; includes wheeled units. Common applications for dynamometers include general purpose, automotive, aircraft or aerospace, chain or belt drives, gearboxes, fluid power systems gas or diesel engines, industrial, marine, transmissions, and turbines. All dynamometers will typically have speed and power feedback for performance testing and monitoring. Typical features include encoders or other speed / position sensors, torque arms, and reaction sensors. Common dynamometer interfaces include integral control console, separate console, computer, or modem or remote control. Features common to dynamometers include PID control, flow control or throttling, data acquisition or logging, alarms, motor power analysis, and engine exhaust analysis. Engine Dynamometer testing solutions for your equipment, ranging from 20-10,000 horse power. For complete verification of all of your transmissions, pumps, and other hydraulic components. Eliminate costly test drives and provide documented proof of quality for truck and bus repairs. Industry-leading expertise for testing solutions in powertrain, rotating equipment, and fluid power industries. Power Test, Inc. is an industry leader in the design, manufacture, and sale of dynamometers, heavy equipment testing systems and related data acquisition and control systems. For over 40 years, Power Test has provided specialized test equipment to manufacturers, rebuild facilities, and distributors in the mining, oil & gas, power generation, marine, trucking, construction, rail, and military markets in over 90 countries on six continents. Our headquarters and manufacturing operations are located in Sussex, WI with sales representatives worldwide. The Power Test team of innovative engineers, designers, software developers, and sales consultants will SOLVE YOUR CHALLENGES with logical solutions. Our skilled machinists, fabricators, electronic technicians, and assemblers build products to meet your unique needs. Our technical service experts are dedicated to working with you, anywhere and anytime. They travel the globe to ensure your equipment is running right and your staff is trained to operate it. Our exceptional product life and manufacturing expertise make us an industry-leading dynamometer manufacturer, as evidenced by our first machine sold, which remained operational for 42 years. Dynamite Acquisition What Is A Dyno? Careers Events An engine dynamometer is a device used to test an engine that has been removed from a vehicle, ship, generator, or various other pieces of equipment. The intent is to confirm performance before the engine is installed. Power Test dynamometers can help facilities troubleshoot by determining an engine's functionality while under load. Additionally, they can verify the quality of a build, rebuild, or repair in a controlled environment before the engine is put into use. Having an engine dyno in your facility will give you confidence and peace of mind that your equipment is fully functional, and that it was fixed right the first time. Power Test's wide range of engine dynamometers feature water brake, eddy current, and alternating current braking technologies, and are capable of testing engines ranging from 50 to 10,000 horsepower. Our versatile line up of products come available in portable and permanent solutions, with a full catalog of testing designed to Make Your Testing Easy. More Products Vehicle repair centers around the world know that Power Test has the chassis dynamometer testing solution they're looking for. Power Test offers testing systems utilizing Eddy Current, Water Brake, or Motorized technologies and has a wide range of configurations available to meet your exact testing specification. Power Test's Eddy Current Dynos offer an easy-to-use testing solution with extremely low annual operating costs, and revenue driving features that guarantee a return on your investment. Without the need for wasteful cooling systems and easier than ever maintenance, our new Flat Deck design is sure to provide the highly-reliable testing system you've been waiting for. Contact your Power Test rep today to learn how a Chassis Dyno makes (dollars and) sense for your business. More Products Our AIDCO Test System product line offers the latest in modern transmissions and hydraulic test stands. These systems are designed and manufactured at Power Test headquarters and are capable of testing transmissions and hydraulic components including valve body test stands, electronic shift consoles, and much more. With detailed user-interfaces and state-of-the-art controllability, you can be confident that your remanufactured transmissions and components are performing as they're supposed to. More Products PowerNet, the trusted solution for complete reliable data acquisition, and control is now more powerful than ever. Version 3.0 offers flexible graphics, remote monitoring and reporting, test facility integration, and professional reports to Make Your Testing Easy. The system is comprised of the Commander Computer, a modified desktop PC, and the Workstation, a touch-screen operated unit housed in a rugged industrial enclosure. Both systems communicate to each other through an Ethernet cable, providing rapid data transfer speeds, wiring simplicity, and LAN connections. Power Test's PowerNet 3.0 controls the unit being tested and measures key parameters - all through the industry's most easy-to-use and reliable system. The system configures with virtually every engine, transmission, or component test stand on the market. More Products The Flatirons Campus features dynamometer research facilities that can validate power-take-off systems for wave and water power devices over a range of capacity ratings—from 1 kW to 5 MW. Capabilities Dynamometers can validate wave and water power-take-off (PTO) systems by replacing the power of the water with a controllable, electric motor. NREL's dynamometer research facilities can evaluate new PTO designs and assess a variety of components and subsystems—including generators, gearboxes, mechanical or electro-dynamic brakes, power electronics, control systems, and software. Manufacturers and design engineers can use our facilities to study PTO system performance and the integration of generators and power electronics with the electric grid, to perform accelerated lifetime certification, and to develop software. Overall capabilities include the ability to: Perform steady-state evaluation to determine a PTO's power curve Conduct highly accelerated assessments in which the PTO is intentionally overloaded to determine its useful operating lifetime Operate in normal rotational or linear motion by using hydraulic actuators Operate in reciprocating (bidirectional) motion and provide or absorb power in either direction Apply secondary forces and moments other than the primary, driving torque or force Use "model-in-the-loop" techniques to emulate various system parameters with computer simulations that are operating in real time Connect to the controllable grid interface so that researchers can better understand how PTOs react to grid disturbances. Dynamometer Specifications When evaluating PTOs, one size does not fit all. NREL has three dynamometers of varying sizes to offer flexibility to its partners. 225-kW Dynamometer The 225-kW dynamometer employs a 300-hp AC induction motore with a variable-frequency drive and AC grid connections of 120 V, 240 V, and 480 V. 2.5-MW Dynamometer The 2.5-MW dynamometer features a 3,351-hp, AC induction motor with a variable-frequency drive and 480 V, 690 V, and 13,200 V AC grid connections. 5-MW Dynamometer The 5-MW dynamometer features an 8,000-hp AC induction motor with variable-frequency drive and 480 V, 690 V, and 13,200 V AC grid connections. See the dynamometer fact sheet for more details about each dynamometer.

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